

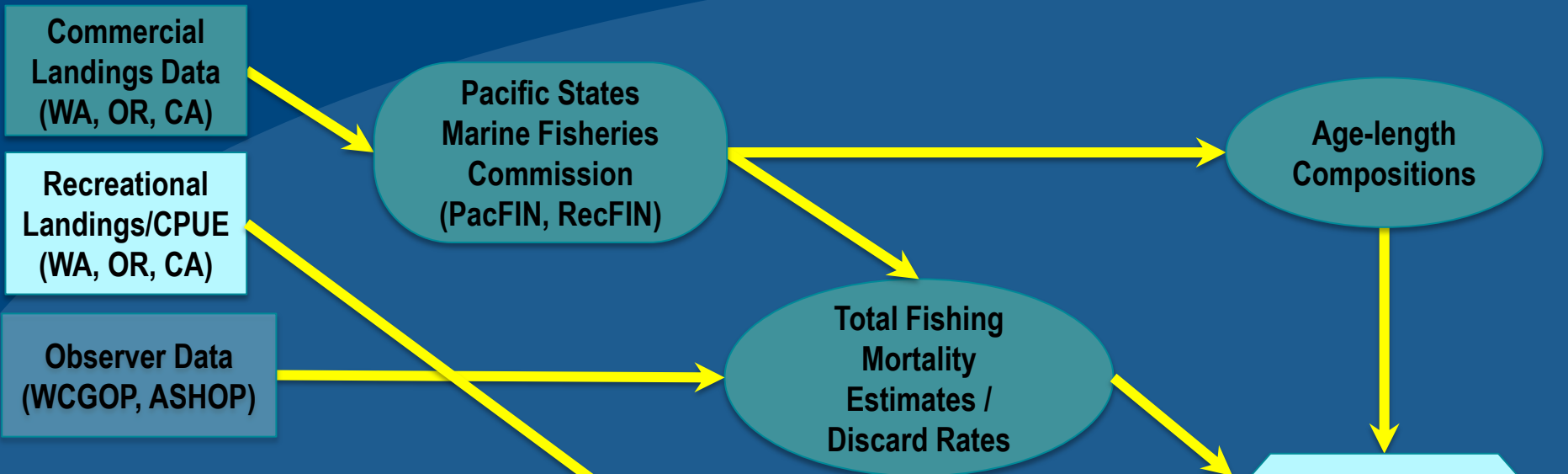


NOAA
FISHERIES

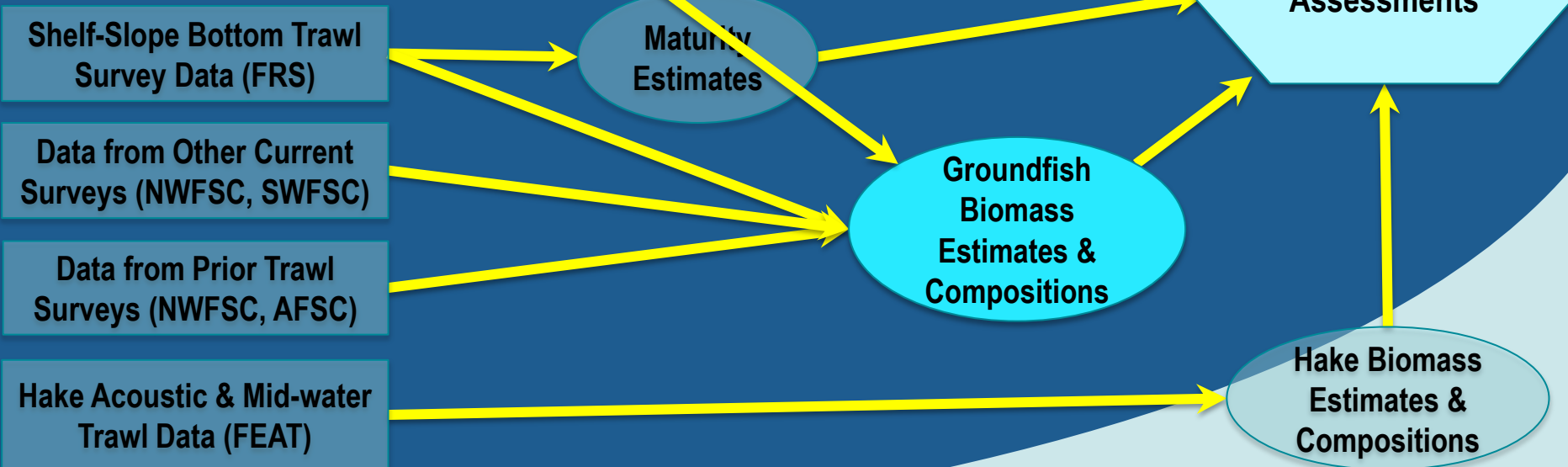
Recreational CPUE data to support stock assessments



Fishery Dependent Data



Fishery Independent Data

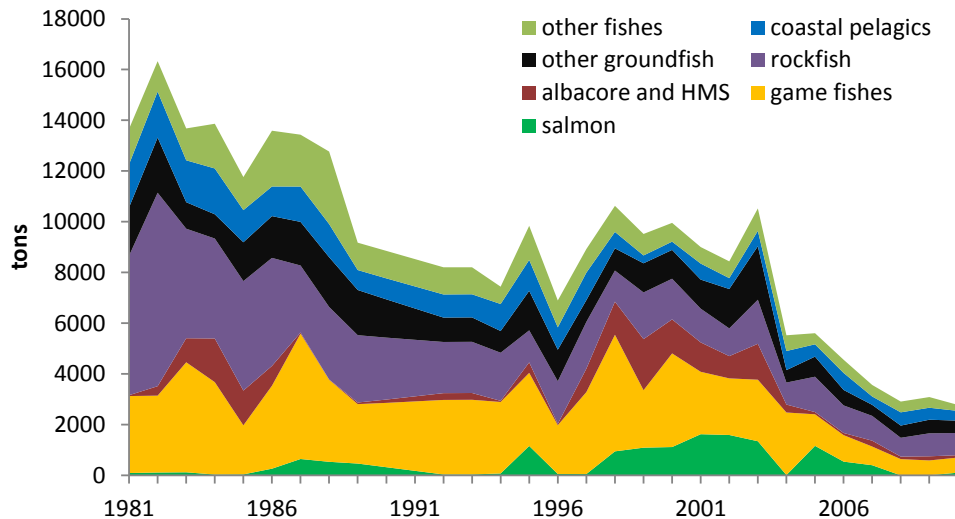


Fishery Data Flows

Recreational Fisheries CPUE Indices

- For nearshore species in particular (~16 species in FMP) recreational CPUE is about the only source of trend information
- Past stock assessments of nearshore and some shelf species have relied on recreational CPUE as key index
- Most recent round of data-moderate assessments (using XDB-SRA) used indices for brown, copper and china rockfish, these were the only indices available.

Recreational Fisheries



California's CPFV fleet is among the largest in the world, started 1920s. In 2009, estimated that 1.5 million saltwater anglers did 4.7 million trips, spent \$1.6 billion dollars*

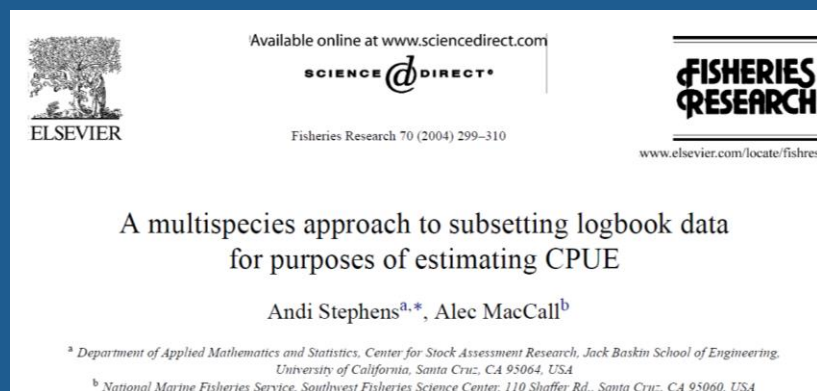


*http://www.nmfs.noaa.gov/stories/2011/12/docs/action_agenda_sw.pdf

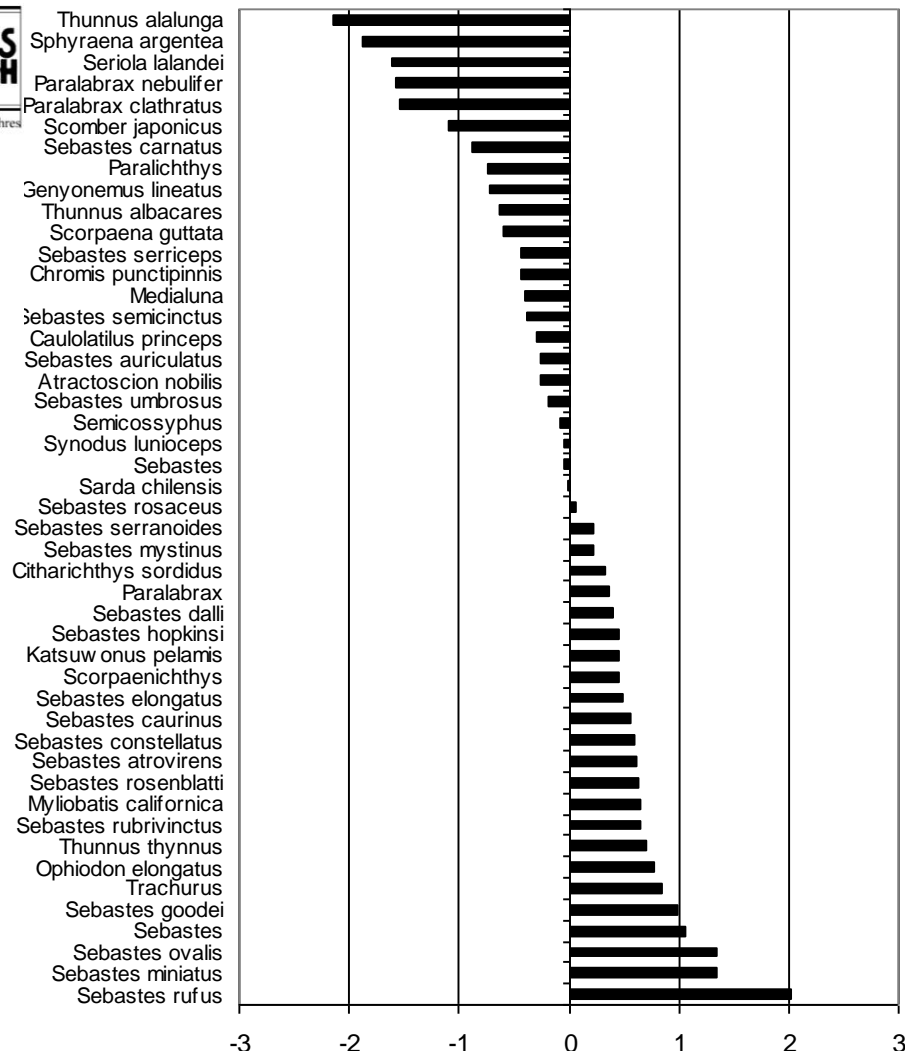
Recreational Fisheries Data Challenges

- There is huge effort and broad diversity of recreational fisheries and habitats, particularly in California.
- Several hundred species caught recreationally, with substantial gradients among community structure over depth and latitude.
- For any given target species, there are lots of structural zeros (no expectation of encounter)
- Vessels may also target numerous habitats on any given trip, making interpretation of traditional (intercept) data particularly challenging

Stephens-MacCall (2005) Approach



- Trip filtering to remove structural zeros, reduce influence of target switching and fishing wrong habitat for a given species
- Particularly important when spatial data not available (e.g., intercept data)
- Used with RecFIN data still, now also used in SE U.S., Australia, many other locations



MRIP Project (E.J. Dick and Melissa Monk, CSTAR) Development of Relational Databases for Onboard Observer Data and Creation of Abundance Indices for Use in Stock Assessments

- Created fully relational databases for CA and OR onboard observer programs
- Both onboard sampling databases are linked to the dockside sampling databases, linking data on retained and discarded catches and lengths
- Central CA portion of the database can be integrated with two additional datasets (historical CPFV observer data, Cal Poly data)

Sampling Coverage

- Tech memos in press (jointly developed with states)
- Oregon
 - 2001,2002-2012
 - 982 trips and 12,169 drifts
 - 50,114 fish (39,169 kept and 10,945 discarded)

California

- 1999-2011
- 7,043 trips and 47,417 drifts
- 430,873 fish (310,122 kept and 120,751 discarded)

Documentation of a Relational Database for the Oregon Sport Groundfish Onboard Sampling Program

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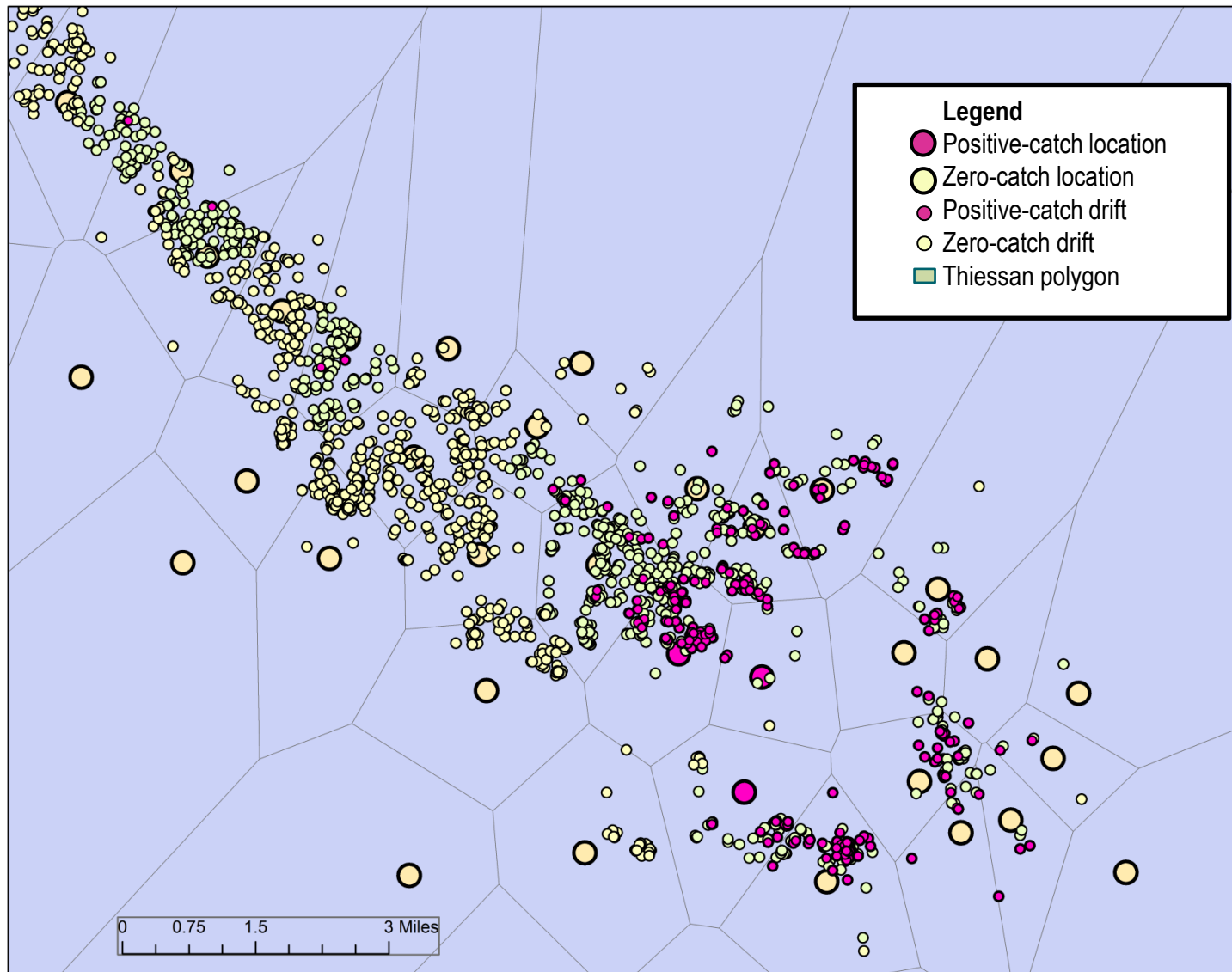
²NOAA Fisheries, Southwest Fisheries Science Center, Fisheries Ecology Division, 110 Shaffer Road, Santa Cruz, CA 95060

³ Oregon Department of Fish and Wildlife, Marine Resources Program, 2040 SE Marine Science Drive, Newport, OR 97365

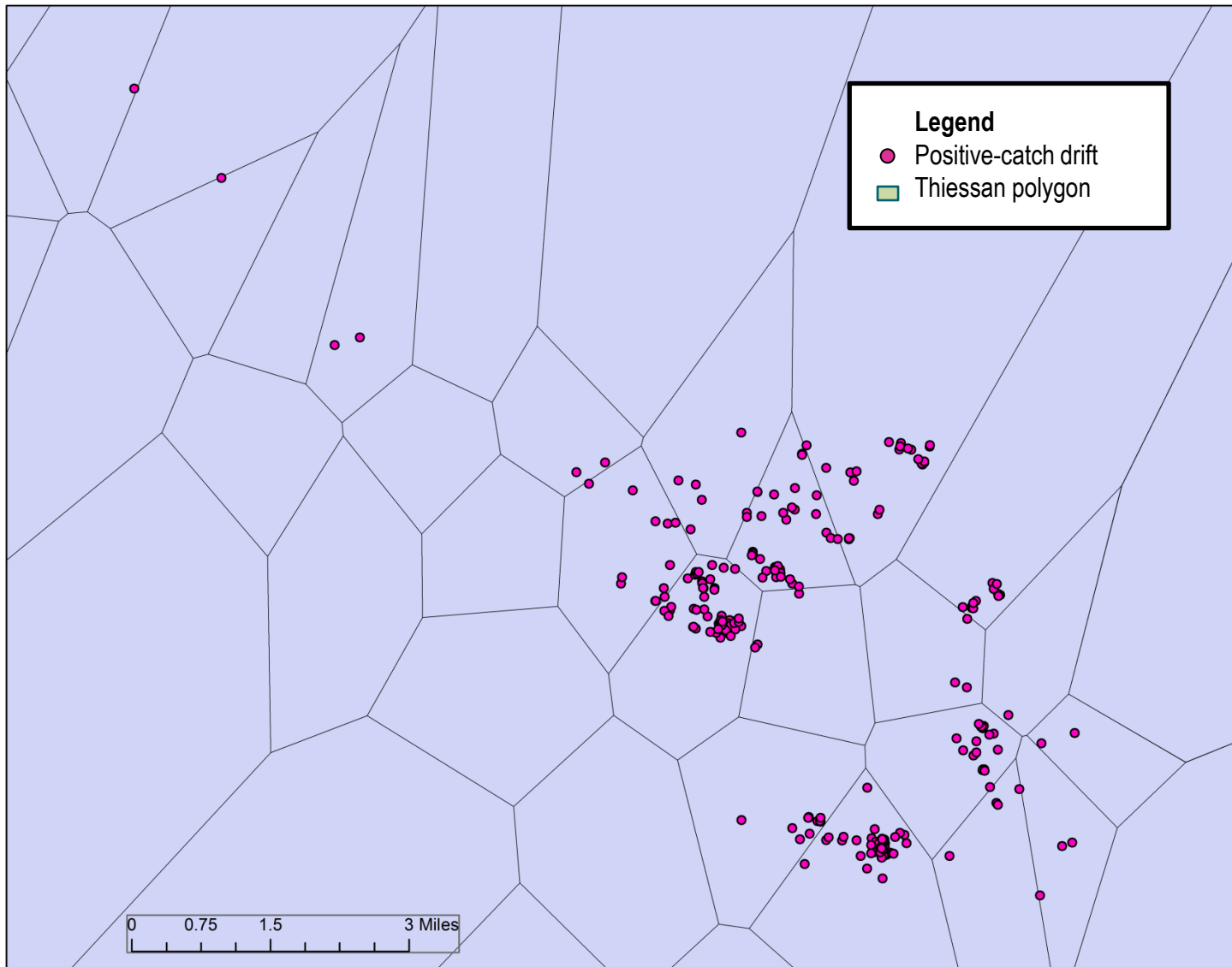
MRIP Project, index development

- Given high resolution spatial data, develop a spatially-explicit alternative method to Stephens-MacCall filtering
- Drift-specific location data allows mapping of species-specific catches to determine “suitable habitat”
 - Create buffered areas around positive-catch observations
- Same method applied to Oregon/northern California and southern California
- Variation of the method used for central California in order to combine datasets with variable spatial resolution

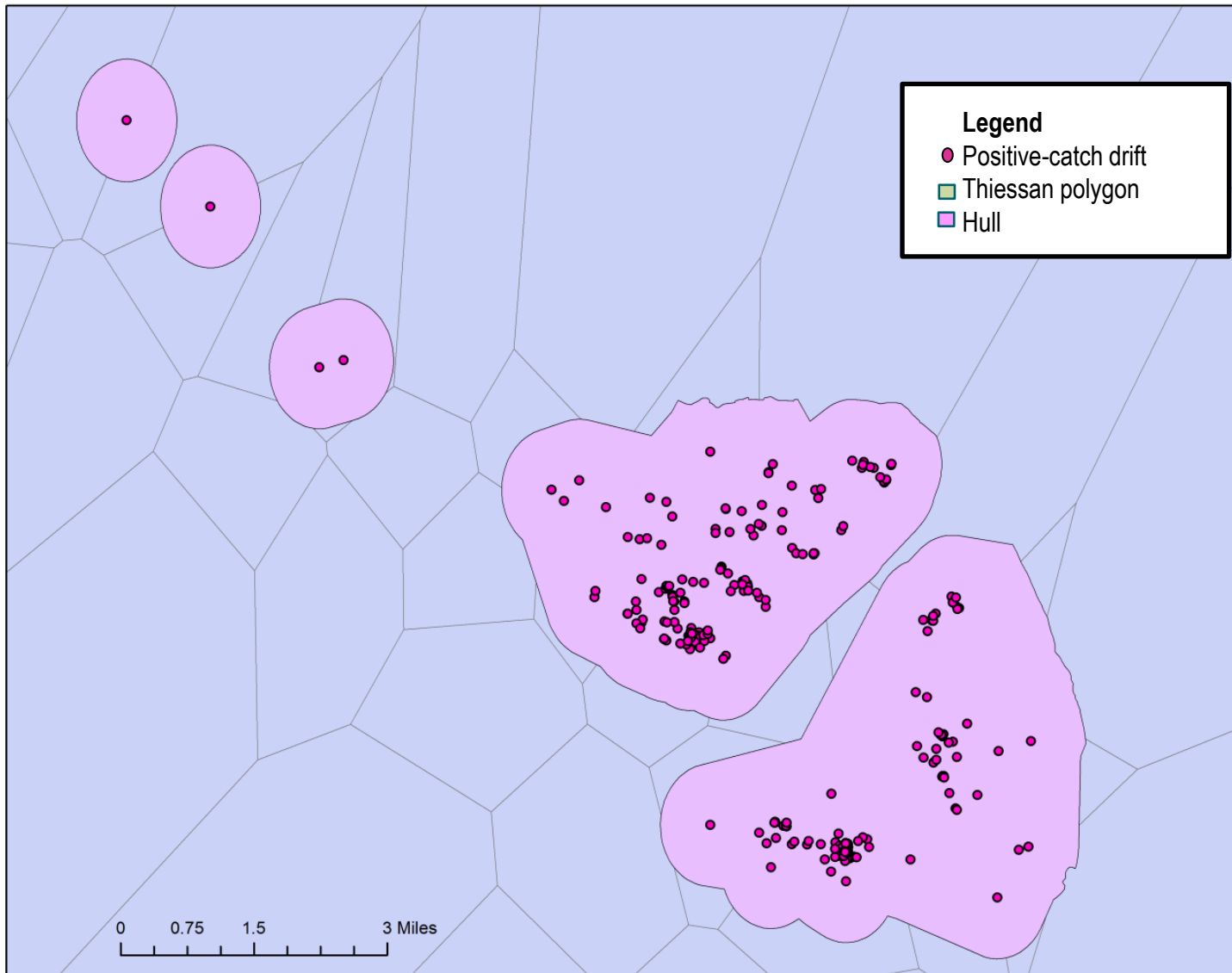
Map fishing sites and drift locations



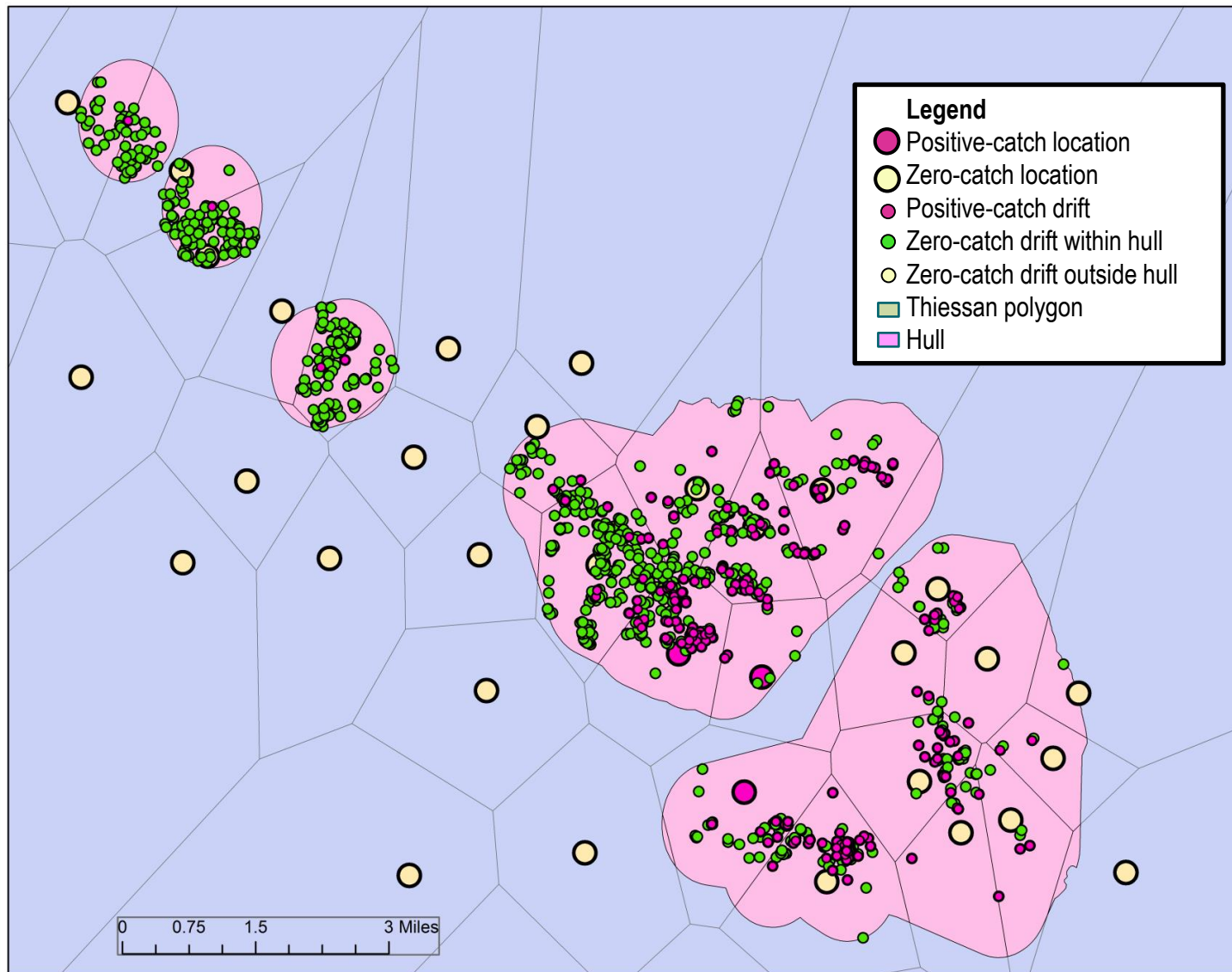
Map only positive-catch drifts



Create buffers



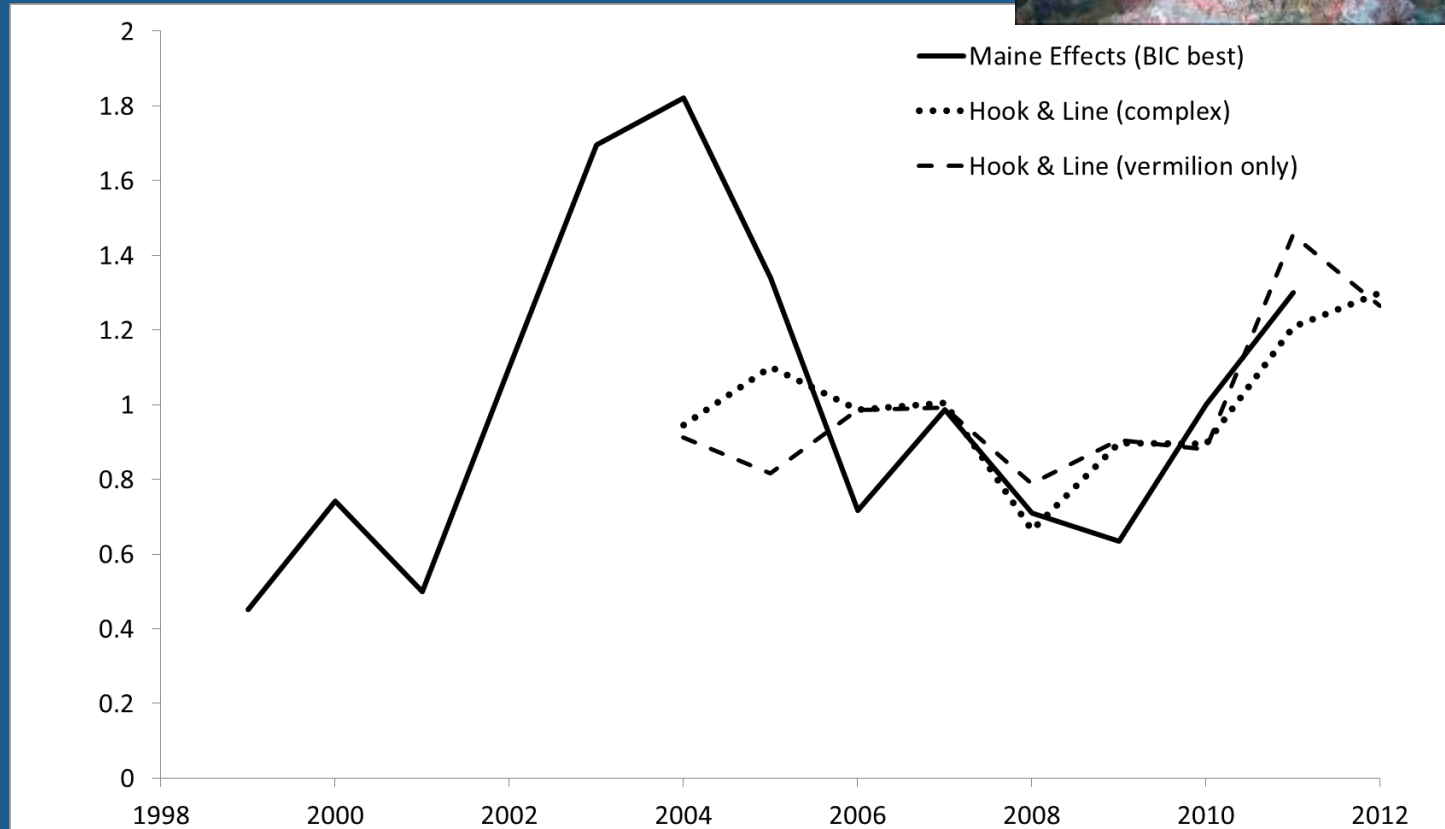
Integrate historical observer data



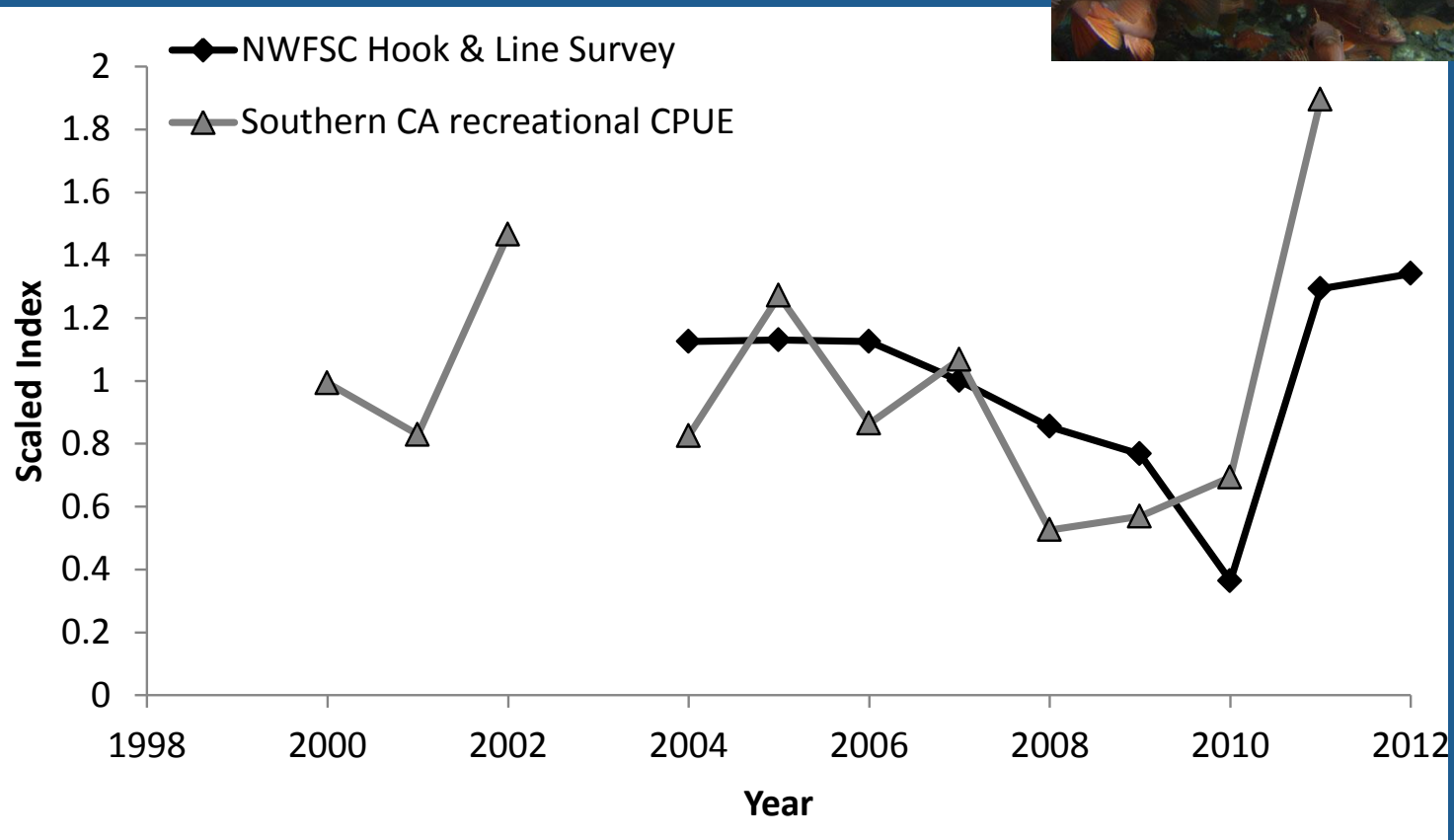
Comparing indices: CDFW onboard observer and the NWFSC Hook and Line Survey

- Comparison made for vermilion rockfish and bocaccio in the Southern Area (south of Pt. Conception)
- Identified drifts from the CDFW onboard program that overlapped with Hook & Line Survey fixed sites
 - Drifts within $\leq 2\text{km}$ of a Hook & Line survey fixed site were retained
 - Represents 71 of 121 Hook & Line Survey sites

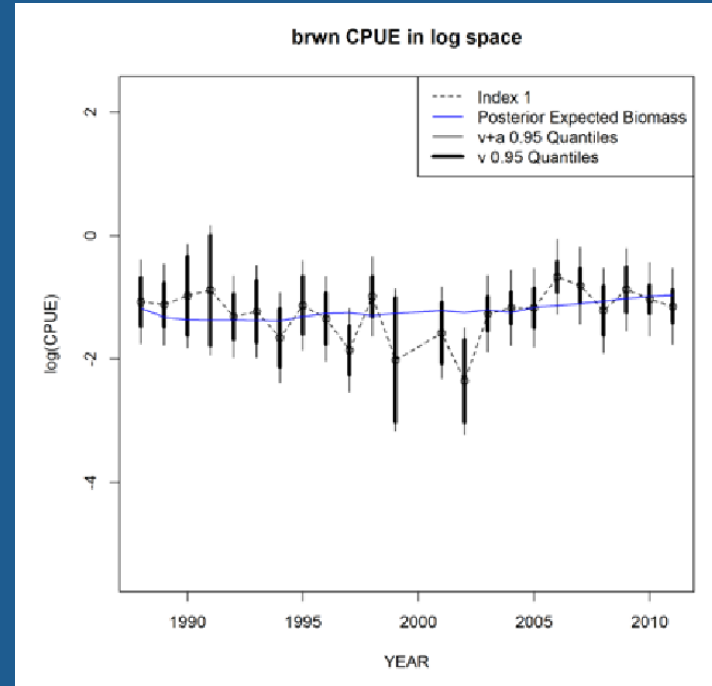
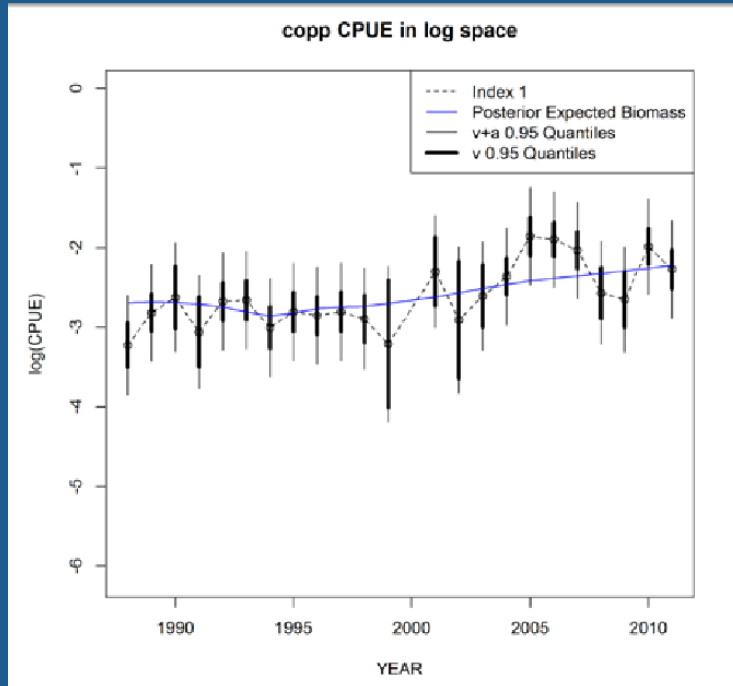
Index comparison for vermillion



Index Comparison for bocaccio



Indices used in 2013 data moderate assessments of copper, brown and china rockfish



Strengths

- Recent observer data for CPFV fleet is comprehensive in OR/CA, very good coverage since early 2000s, demonstrated to be useful for index development
- Good spatial resolution, drift level data (effort to the minute!), currently linked to habitat (depth, bottom type, 2m resolution data from CA state/USGS)
- Historical CPUE data available in Central California can be linked to recent data
- Data is collected as part of established state monitoring programs

Challenges

- Recovery of the historical drift-specific effort and catch information was highlighted as a key data need in the data-moderate assessment review
- Continued refinement of analytical methods for index development (alternative means of modeling spatial effects)
- Regulatory changes (depth, hook, bag limits, closed areas) affect interpretation of results, could truncate time series, challenge interpretation
- Constraints highlighted in hook and line survey also relevant (re: hook saturation, nonlinearity of effects)
- ANY fishery dependent index has its limitations!

Solutions

- Recovery of historical drift-level data will be time intensive/costly (but not terribly, currently seeking MRIP, other funds to support)
- Linking CPUE data to improved habitat information should continue to help reduce or eliminate structural zeros, as could other analyses
- Further exploration of the consistency of CPUE indices with those from other current or potential fishery independent indices should be undertaken